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A Correction to "The Additive Groups of Rings Possessing Only Finitely Many Ideals"

by

Shalom FEIGELSTOCK

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The proof of the implication 2⇒3) in Theorem 2 of [1] is wrong. The result however is correct, and may be proved as follows:

2)⇒3): Suppose that there infinitely many primes $\{p_i\}_{i=1}$ for which $G_{p_i}\neq 0$. Let R be a ring satisfying the ACC for ideals with $R^+=G$. The chain

$$G_{p_i}\subset \bigoplus_{i=1}^{2} \subset\cdots\subset \bigoplus_{i=1}^{k} G_{p_i}\subset\cdots$$

is a properly ascending, infinite chain of ideals in R, a contradiction. Therefore, $G_p\neq 0$ for only finitely many primes $\{p_i\}_{i=1}^n$. Let $p\in\{p_i\}_{i=1}^n$. Since $G[p]\subset G[p^2]\subset\cdots\subset G[p^m]\subset\cdots$ is an ascending chain of ideals in R, there exists a positive integer m such that $G_p=G[p^m]$. Hence for each $i=1,\cdots,n$ there exists a positive integer n_i such that $G_{p_i}=G[p_i^{n_i}]$, i.e.,

$$G_{p_i}=\bigoplus_{j=1}^{n_i}\bigoplus_{\alpha j} Z(p_i^j),$$

α_j an arbitrary cardinal, $j=1,\cdots,n_i$. Clearly G is of the form of condition 3).

Reference

[1] FEIGELSTOCK, S.; The additive groups of rings possessing only finitely many ideals, *Comment. Math. Univ. Sancti Pauli*, **28** (1980), 209–213.

Bar Ilan University
Ramat Gan
Israel